

## DESCRIPTION OF SUBJECTS TAKEN DURING HIGHER EDUCATION

1.	BI1001	<b>Pengetahuan Lingkungan</b> <i>Environmental Science</i>	<b>2 Semester Credit Units</b>
		Concepts, principles and theories in ecology and environmental science; environmental management and sustainable development; natural resources (availability, use, problems in management); environmental problems and solutions; population rise and sociocultural-economic change; current state of the national and global environment.	
2.	EC3001	<b>Struktur Data dan Algoritma</b> <i>Data Structure and Algorithm</i>	<b>3 Semester Credit Units</b>
		Algorithm Analysis, Lists, Stacks, and Queues, Trees, Hashing, Priority Queues (Heaps), Sorting, The Disjoint Set ADT, Graph Algorithms, Algorithm Design Techniques, Amortized Analysis, Advanced Data Structures and Implementation.	
3.	EC3003	<b>Sistem Komputer</b> <i>Computer System</i>	<b>3 Semester Credit Units</b>
		Course Overview, Representative and Manipulating Information, Machine-level Representation of C Programs, Processor Architecture, Optimizing Program Performance, The Memory Hierarchy, Linking, Exception Control Flow, Measuring Program Execution Time, Virtual Memory, Concurrent Programming with Threads, Network Programming.	
4.	EC3004	<b>Rekayasa Perangkat Lunak</b> <i>Software Engineering</i>	<b>3 Semester Credit Units</b>
		This course aims to discuss some basic notions of Software Engineering and complete software lifecycle. The course material consists of all software development phases, including : software analysis, software design, software construction, testing and maintenance. Software development methods, such as SDLC and OOSE, are subject of exploration for student practice works. The objectives of this course are giving the overall software engineering methodologies and applying software development techniques in the real world.	
5.	EC3007	<b>Praktikum Teknik Komputer I</b> <i>Computer Engineering Laboratory I</i>	<b>1 Semester Credit Units</b>
		In this course lectures and laboratory experiments will be given in the basic techniques of designing, deploying, and analyzing computer systems and computer networks.	
6.	EC3008	<b>Praktikum Teknik Komputer II</b> <i>Computer Engineering Laboratory II</i>	<b>1 Semester Credit Units</b>
		In this course lectures and laboratory experiments will be given in the basic techniques of designing and usage computer and DSP as tools and systems, the study of computer architecture, and the study of operating systems.	
7.	EC3010	<b>Jaringan Komputer</b> <i>Computer Networks</i>	<b>3 Semester Credit Units</b>
		Introduction; technology development, communication technology and convergence of computer technology and communication, standards and communication networks architecture; standards and computer networks architecture, infrastructure and communication networks technology; data transmission and modulations; communication protocols and algorithms; Local Area Network (LAN) and High	

	Speed LAN; internetworking; internet TCP/IP; internet TCP/IP as infrastructure of multi-service networks, performance monitoring and internet security.		
8.	EC3020	<b>Arsitektur Komputer dan Desain</b> <i>Computer Architecture and Design</i>	3 Semester Credit Units
	<p>Concepts of modern computer architecture. Processor micro-architectures, arithmetic operations, hardwired vs. micro-programmed control, and bus-based system architecture concepts. This course will provide a thorough understanding of MIPS assembly language and an introduction to the design of uniprocessor systems. This course will also discuss the impact of architecture choices on software developments. Topic includes MIPS assembly language instruction set, instruction set design principles, addressing, arithmetic operations and number system reviews, ALU development, data-path development, hardwired and micro-programmed data-path control, and simple pipelining to enhance performance.</p>		
9.	EC3021	<b>Sistem Pengoperasian</b> <i>Operating System</i>	3 Semester Credit Units
	<p>This course provide an introduction to operating system design and implementation. The operating system provides a well-known, convenient, and efficient interface between user programs and the bare hardware of the computer on which they run. The operating system is responsible for allowing resources (e.g., disks, networks, and processors) to be shared, providing common services needed by many different programs (e.g., file service, the ability to start or stop processes, and access to the printer), and protecting individual programs from one another.</p> <p>The course start with a brief historical perspective of the evolution of operating systems over the last fifty years, and then cover the major components of most operating systems. This discussion will cover the tradeoffs that can be made between performance and functionality during the design and implementation of an operating system. Particular emphasis will be given to three major OS subsystems: process management (processes, threads, CPU scheduling, synchronization, and deadlock), memory management (segmentation, paging, swapping), file systems, and operating system support for distributed systems.</p>		
10.	EC4002	<b>Kapita Selektia</b> <i>Selected Topics</i>	1 Semester Credit Units
	<p>Introduction: general course description, course objectives, course outline, evaluation. The required general competences of university graduates, the importance of intellectual intelligence, emotional intelligence and spiritual intelligence. The essential skills: communication and language competency, paper &amp; report writing, presentations. Time management, personality, collaboration, entrepreneurship. Curriculum vitae, application letters. Selected new developments in Electrical Engineering and Computer Engineering.</p>		
11.	EC4005	<b>Praktikum Teknik Komputer III</b> <i>Computer Engineering Laboratory III</i>	1 Semester Credit Units
	<p>In this course lectures and laboratory experiments will be given in the basic techniques of designing, building, analyzing, and troubleshooting embedded systems and VLSIs.</p>		
12.	EC4010	<b>Komputasi Berbasis Jaringan</b> <i>Network-Based Computing</i>	3 Semester Credit Units
	<p>Computer System: System View, Information Security; Computer Networks:</p>		

		Introduction, Network Management, Web as a CS, Web Application, Web Programming; Mobile & Ubiquitous Computing: History & Vision, Limitations & Achievements; Wireless Communication Networks: Introduction (History, Review of Wireless Communications Maths, Wireless Propagation), Mobile Wireless(GSM, GPRS, EDGE, W-CDMA, CdmaOne, cdma2000-1X, EV-DO, EV-DV, 3X), Fixed Wireless(WLL, LMDS, MMDS, Satellites, Wi-Fi, WiMAX, ZigBee), Other Technologies (HAPS, Laser, mmWave, UWB); Programming with Symbian.	
13.	EC4011	<b>Rekayasa Trafik dan Desain Jaringan Multilayanan</b> <i>Traffic Engineering and Multiservice Network Design</i>	<b>2 Semester Credit Units</b>
		Introduction to Teletraffic Engineering; Traffic concepts and grade of service; Probability Theory and Statistics; Time Interval Distribution; Arrival Processes; The Poisson process; Erlang's loss system and B-formula; Loss systems with full accessibility; Overflow theory; Multi-Dimensional Loss Systems; Dimensioning of telecom networks; Delay Systems; Applied Queuing Theory; Networks of queues; Traffic measurements.	
14.	EC4040	<b>Dasar Intelegensia Artifisial</b> <i>Fundamentals of Artificial Intelligence</i>	<b>3 Semester Credit Units</b>
		Intelligent Agents, AI Problem formulation , AI as Search, Uninformed search methods, Informed search methods, Game playing, Planning, Partial order planning, Knowledge Based System, AI Languages.	
15.	EC4041	<b>Pengolahan Citra &amp; Pengenalan Pola</b> <i>Image Processing &amp; Pattern Recognition</i>	<b>3 Semester Credit Units</b>
		Introduction to Digital Image Processing, Image Perception and Color, Multidimensional Sampling and Quantization, Review on 2D System and Algebra, Image Transforms, Image Enhancement, Image Restoration, Feature: introduction on pattern analysis and computer vision, Concept of Digital Pattern Recognition, Review on Probability Theory and Linear Algebra (Vectors and Matrices), Bayesian Decision Theory, Quadratic Classifier, Parameter Estimation, Linear Discriminant Function, Introduction to Neural Networks.	
16.	EC4050	<b>Pengkodean Informasi &amp; Kompresi Data</b> <i>Information Coding &amp; Data Compression</i>	<b>2 Semester Credit Units</b>
		Introduction and issues; Information Measure, Entropy, Channel Capacity; Codes; Lossless Coding, Entropy Coding Huffman Code, Arithmetic Code, Text Coding; Lossy Coding, Speech, Audio, Image, Video Coding, Standards; Streaming.	
17.	EC4060	<b>Sistem Embedded</b> <i>Embedded System</i>	<b>3 Semester Credit Units</b>
		Introduction : Embedded System Overview, Design Challenge & Optimizing Design Metrics, Processor Technology, Design Technology, Tradeoffs Custom Single-Purpose Processors : Hardware, General-Purpose Processors : Software, Memory, Digital Camera Example, State Machine and Concurrent Process Models Control Systems, IC Technology, Design Technology : Synthesis, Verification, H/W an S/W Co-simulation.	
18.	EC4061	<b>Periferal &amp; Antar Muka</b> <i>Peripheral &amp; Interface</i>	<b>3 Semester Credit Units</b>
		Analysis of computer peripherals technology (Laser technology --DVD/CD, Printer--,	

		LCD/TFT Display, Storage/memory). Standard in computer/microprocessor interfacing (USB, Backplane --EISA, PCI, VME--, SCSI, I2C). Wireless technology (Bluetooth, IrDA, IEEE 802.11). Future trend in computer and interfacing (portable/pocket mobile computer).	
19.	EC40K0	<b>Kerja Praktek</b> <i>Internship</i>	<b>1 Semester Credit Units</b>
		This course facilitates students to learn how to work in industries, how to implement theories form courses in industrial real problems, and how to act professionally as employee. Students have to work in industries for at least two months, able to write reports about the work and present it in front of the class. Reports and presentations are evaluated by lecturers, and the final grade is composed of the evaluation from supervisor in work place and lecturers.	
20.	EC40Z1	<b>Tugas Akhir I &amp; Seminar</b> <i>Final-year Project I &amp; Seminar</i>	<b>1 Semester Credit Units</b>
		The student is planned to do preliminary study/design of her/his final-year project. Under his/her supervisor, the student has to submit the final-year proposal, abstract and finally full paper which should be presented in student's seminar. The student has to work in the laboratory to do his/her research during the semester time.	
21.	EC40Z2	<b>Tugas Akhir II</b> <i>Final-year Project II</i>	<b>4 Semester Credit Units</b>
		In this individual assignment, the student should continue her/his previous work in EL40Z1 course under the same supervisor. The work resulted in this project could be in the form of any implementation (software/hardware), even in the form of recommendation of solution to the electrical engineering problems. At the end of this project, the student should write the final report, and then defended in front of 3 examiners (lecturers).	
22.	EC5000	<b>Teknologi Berorientasi Objek</b> <b>Menggunakan Java</b> <i>Object-Oriented Technology Using Java</i>	<b>2 Semester Credit Units</b>
		Introduction to OO Concept and Technology. Basic of Java Environment. Introduction to Java Applications. Introduction to Java Applets. Control Structures: Part 1. Control Structures: Part 2. Methods Arrays. Object-Based Programming. Object-Oriented Programming. Strings and Characters. Graphics and Java2D. Basic Graphical User Interface Components. Advanced Graphical User Interfaces Exception Handling. Multithreading. Multimedia: Images, Animation, Audio and Video. Files and Streams. Java Database Connectivity (JDBC). Servlets Remote Method Invocation (RMI). Networking Data Structures. Java Utilities Package and Bit Manipulation. Collections. JavaBeans.	
23.	EC5010	<b>Keamanan Sistem Informasi</b> <i>Information System Security</i>	<b>2 Semester Credit Units</b>
		Introduction; Conventional Encryption: Classical Techniques, Modern Techniques, Algorithms, Confidentiality Using Conventional Encryption; Public-Key Encryption and Hash Functions: Public-Key Cryptography, Introduction to Number Theory, Message Authentication and Hash Functions, Hash and Mac Algorithms, Digital Signatures and Authentication Protocols; Network Security Practice: Authentication Applications, Electronic Mail Security, IP Security, Web Security; System Security: Intruders, Viruses, and Worms, Firewalls.	

24.	EC5040	<b>Interaksi Manusia dengan Komputer</b> <i>Human-Machine Interaction</i>	2 Semester Credit Units
		The study of three different perspectives: human (psychological aspects of the user); computer (peripherals and tools); interaction (analysis, design, and evaluation of human-machine interfaces). Besides presenting the fundamental concepts, the course highlights some recent relevant developments of the field, such as 3D Interfaces, Groupware, World Wide Web interfaces, speech synthesizer, speech recognition, natural language processing, image recognition.	
25.	EC5050	<b>Sistem Multimedia</b> <i>Multimedia System</i>	2 Semester Credit Units
		Multimedia definition, multimedia communications, multimedia information representation, text and image compression, audio and video compression, standard for multimedia communications, enterprise network, application support. Programming with BREW.	
26.	EL1001	<b>Pengantar Rangkaian Elektrik</b> <i>Introduction to Electric Circuits</i>	2 Semester Credit Units
		Introduction. Electric measurements. Signal and device models. Ohm's and Kirchoff's Law, series and parallel circuits, equivalent circuits, voltage and current divisor. Circuit proportionality theorem, superposition, Thevenin/Norton theorem, Tellegen theorem. Analysis methods : output unit, circuit reduction, superposition, Thevenin, node voltage. Direct current measurement circuit, direct current power processing circuit, signal processing circuit. Alternate current steady state circuit : phasor and impedance methods, power analysis. Balanced three-phase system. Lecture on electric circuit development.	
27.	EL10T1	<b>Konsep Teknologi</b> <i>Concept of Technology</i>	2 Semester Credit Units
		Philosophy and history of science, technology and art; local and global development of science, technology and art. Model, system, feedback, stability, decision making, optimization, and problem-solving case study; application of science, technology and art for human prosperity; intellectual property rights.	
28.	EL2001	<b>Dasar Pemrograman Berorientasi Obyek</b> <i>Introduction to Object Oriented Programming</i>	3 Semester Credit Units
		The course covers basic of object-oriented programming using C++. C++ and C programming language are widely used for various system developments such as software for graphics, GUI and applications, through software closely related to the hardware (embedded system). The course provide the students with both theory and practice, programming exercises and test will be given.	
29.	EL2002	<b>Probabilitas &amp; Statistika</b> <i>Probability and Statistics</i>	3 Semester Credit Units
		Probability concepts, random variable and its distribution, combinatorial and geometrical elements, conditional probability, Bayes theorem, distribution function, bivariate random variables, random variable function, estimation, hypothesis evaluation.	
30.	EL2003	<b>Rangkaian Elektrik</b> <i>Electric Circuits</i>	3 Semester Credit Units
		The operational amplifier, energy storage elements, the complete response of RL and	

		RC circuits, the complete response of circuits with two energy storage elements, sinusoidal steady state analysis, AC steady state power, three phase circuits, frequency response, Introduction to electric machines.	
31.	EL2004	<b>Sinyal dan Sistem</b> <i>Signals and Systems</i>	3 Semester Credit Units
		Continuous time signals and systems, Fourier transform, frequency response, Fourier series, Laplace Transform, Energy and power spectral, passive filter design: Butterworth, Chebyshev, active filter design.	
32.	EL2005	<b>Rangkaian Logika dan Teknik Digital</b> <i>Logic Circuits and Digital Techniques</i>	3 Semester Credit Units
		Basic building blocks and design methods to construct synchronous digital systems. Alternative representations for digital systems. Bipolar TTL vs. MOS implementation technologies. Standard logic (SSI, MSI) vs. programmable logic (PLD, PGA). Finite state machine design. Digital computer building blocks as case studies. Introduction to computer-aided design software. Formal hardware laboratories and substantial design project.	
33.	EL2006	<b>Pengukuran dan Instrumentasi</b> <i>Measurement and Instrumentation</i>	3 Semester Credit Units
		Measurement principles, signal processor, electrical measurement, sensor & transducer, non electrical measurement, signal generator principle, wave and spectrum analyzer.	
34.	EL2007	<b>Praktikum Teknik Elektro I</b> <i>Electrical Engineering Laboratory I</i>	1 Semester Credit Units
		In this course lectures and laboratory experiments will be given in the introduction to basic electrical engineering instruments: Analog and Digital Multimeters, Signal Generators, and Oscilloscopes; physical observation of circuit theorems; circuit behavior in DC and first order response; introduction to measurement in digital circuit; basic digital logic gates, combinational and sequential circuits, encoders and decoders, simple digital circuit design and implementation using standard logic and FPGA.	
35.	EL2008	<b>Praktikum Teknik Elektro II</b> <i>Electrical Engineering Laboratory II</i>	1 Semester Credit Units
		In this course lectures and laboratory experiments will be given in the basic techniques of measuring transmission lines, frequency response, small and large resistance, and electric power along with observation of Diode i-v characteristics and rectifying circuits, BJT and FET -iv characteristics, and their application as small signal amplifiers, switches, and basic logic gates.	
36.	EL2009	<b>Matematika Diskrit</b> <i>Discrete Mathematics</i>	3 Semester Credit Units
		Logic (especially propositional logic) and proof, set theory, matrice, relation and function, mathematical induction, algorithm and integers (number theory), combinatory and discrete probability, Boolean algebra, graph and its application, tree and its application, algorithm complexity.	
37.	EL2010	<b>Elektronika I</b> <i>Electronics I</i>	3 Semester Credit Units
		Introduction to electronics; Diode: physical operation, IV characteristics, modeling and circuit analyses, circuit application; Bipolar junction transistor (BJT): physical	

		operation, IV characteristics, modeling and circuit analyses, single stage amplifier, transistor as a switch; Field Effect Transistor (FET) :physical operation, IV characteristics, modeling and circuit analyses, single stage amplifier, logic inverter and analog switch, other FET devices; Logic circuit families: bipolar and MOS.	
38.	EL3001	<b>Medan Elektromagnetik I</b> <i>Engineering Electromagnetics I</i>	<b>3 Semester Credit Units</b>
		Vector analysis and coordinate system, static electric field and field intensity, electric flux density, Gauss law and divergent, energy and potential field, conductor materials, dielectric and capacitance, potential map and magnetic flux, solution to Poisson and Laplace equations, steady state magnetic field, force, magnetic induction and material, continuous changes of magnetic field, propagation and reflection of plane wave, plane wave at boundary and inside dispersive media, transmission cable, basic of antenna.	
39.	EL3002	<b>Pengolahan Sinyal Digital</b> <i>Digital Signal Processing</i>	<b>3 Semester Credit Units</b>
		An introduction to signals and systems, and representation of signals in time domain; Linear, time-invariant systems, impulse response and convolution sum; Linear constant-coefficient difference equation, Fourier transform and frequency response; z-transform and its properties; Discrete Fourier transform (DFT); Signal analysis and synthesis based on DFT; Fundamental structures of digital filters; Internal representation of LTI systems; Digital filter design - I; Digital filter design - II.	
40.	EL3006	<b>Sistem Mikroprosesor &amp; Lab</b> <i>Microprocessor System &amp; Lab.</i>	<b>3 Semester Credit Units</b>
		Introduction Microprocessor : Binary, Hexadecimal, Octal, ALU, Instruction Set , Data Bus, Address Bus, Latch, Address decoder; Register : General purpose, Stack pointer, Index, Flag, Instruction pointer, Accumulator; Serial Input/output : Baud rate, Synchronous and Asynchronous serial communication, Data formatting; Parallel I/O : Unidirectional and Bidirectional, Handshaking; Memory : ROM , RAM , Flash; ADC and DAC; Display: LCD, LED; Key-pad; Motor : Stepper, Servo.	
41.	EL4015	<b>Desain Sistem VLSI</b> <i>VLSI Systems Design</i>	<b>3 Semester Credit Units</b>
		Introduction to VLSI System Design; Historical Perspective; VLSI Design Flow; Design Hierarchy; Concepts of Regularity, Modularity and Locality; VLSI Design Styles CMOS Logic; CMOS Transistors; The CMOS Process; CMOS Design Rules; Combinational Logic Cells; Sequential Logic Cells; Datapath Logic Cells; I/O Cells; Cell Compilers. This course introduces mask-level integrated circuit design for digital circuit design. Correct engineering design methodology is emphasized. Topics covered in lectures include: CMOS processes, mask layout methods and design rules, circuit characterization and performance estimation, standard cell design and use, custom data path circuit design, use of CAD tools for VLSI design, design for testability, CMOS subsystem and system design. This is a project-oriented course in which you will design a modest-sized CMOS integrated circuit. The homework assignments and the project will require the use of CAD Tools (Synopsys). Integrated circuit design is mastered only through experience. The homework, as well as lectures, will be closely tied to the term project, the design of a simple standard cell	

	<p>library and then the use of that library to design a project. The initial design of cells for the project will be done individually. The final library and project will be done in teams. The project must be completed, and you must submit a final report in the format specified.</p> <p>For 2008, the final report (the report) was submitted to the 11<sup>th</sup> LSI Design Contest held by University of Ryukyu, Okinawa, Japan.</p>		
42.	ET3001	<p style="text-align: center;"><b>Sistem Komunikasi I</b> <i>Communication Systems I</i></p>	3 Semester Credit Units
	<p>Communications subsystems, Random Processes, Fourier Transformation, Continuous Modulation : Amplitude Modulation, Frequency and Phase Modulation; Transmitters and Receivers, Noise in Communication systems, Pulse Code Modulation.</p>		
43.	FI1101	<p style="text-align: center;"><b>Fisika Dasar I A</b> <i>Basic Physics I A</i></p>	4 Semester Credit Units
	<p>Measurement; Motion Along a Straight Line; Vectors; Motion in Two and Three Dimensions; Force and Motion; Kinetic Energy and Work; Potential Energy and Conservation of Energy; Systems of Particles; Collisions; Rotation; Rolling, Torque, and Angular Momentum; Equilibrium and Elasticity; Gravitation; Fluids; Oscillations; Waves; Temperature, Heat, and the First Law of Thermodynamics; The Kinetic Theory of Gases; Entropy and the Second Law of Thermodynamics.</p>		
44.	FI1201	<p style="text-align: center;"><b>Fisika Dasar II A</b> <i>Basic Physics II A</i></p>	4 Semester Credit Units
	<p>Electric Charge; Electric Fields; Gauss' Law; Electric Potential; Capacitance; Current and Resistance; Circuits; Magnetic Fields; Magnetic Fields Due to Currents; Induction and Inductance; Electromagnetic Oscillations and Alternating Current; Electromagnetic Waves; Modern Physics.</p>		
45.	KI1111	<p style="text-align: center;"><b>Kimia Dasar I A</b> <i>Basic Chemistry I A</i></p>	3 Semester Credit Units
	<p>Stoichiometry, energetics, structure of atom and molecules, periodic table of elements, appearance of substances : gas and solid state, equilibrium.</p>		
46.	KI1211	<p style="text-align: center;"><b>Kimia Dasar II A</b> <i>Basic Chemistry II A</i></p>	3 Semester Credit Units
	<p>This course covers solution, colloid, oxidation reduction, electrochemistry, kinetics, radiochemistry, chemistry of the elements: hydrogen, oxygen and sulphur, nitrogen and phosphorus, halogen, inert gases, alkali, and earth alkali, transition element, aluminum, heavy metals, important metals in Indonesia, organic chemistry, environmental chemistry and biochemistry.</p>		
47.	KU1011	<p style="text-align: center;"><b>Tata Tulis Karya Ilmiah</b> <i>Academic Writing</i></p>	2 Semester Credit Units
	<p>This course is an advanced interdisciplinary writing course emphasizing critical reading and thinking, argumentative writing, library research, and documentation of sources in an academic setting. The course emphasizes the practice and study of selected rhetorics of inquiry that are employed in academic disciplines. It will also emphasize preparing students for different systems of writing in their professional lives. The course held in Indonesian.</p>		
48.	KU1022	<p style="text-align: center;"><b>Penulisan Teks Akademik</b> <i>Academic Writing</i></p>	2 Semester Credit Units

	This course is an advanced interdisciplinary writing course emphasizing critical reading and thinking, argumentative writing, library research, and documentation of sources in an academic setting. The course emphasizes the practice and study of selected rhetorics of inquiry that are employed in academic disciplines. It will also emphasize preparing students for different systems of writing in their professional lives. The course held in English.		
49.	KU1131	<b>Olah Raga I</b> <i>Sports I</i>	<b>1 Semester Credit Units</b>
	Sports Science, Body Fitness, Training Principles, Athletic Base Techniques, Biomechanics, Organization of Contest, Nutrition, Physical Exercises.		
50.	KU1254	<b>Olah Raga Karate</b> <i>Sports II: Karate</i>	<b>1 Semester Credit Units</b>
	Warm-up and conditioning exercises, Fists, Stances, Punching, Blocking, Kicks, Kata, Basic Kumite, Self-Defense Techniques		
51.	KU2061	<b>Agama dan Etika Islam</b> <i>Islamic Religion dan Ethics</i>	<b>2 Semester Credit Units</b>
	Islam and Sunatullah, Islamic Concept about God, Sources of Islam Teaching, Al Qur'an, Sunah, Fiqih, Muamalah		
52.	KU2071	<b>Pancasila dan Kewarganegaraan</b> <i>Pancasila and Civics</i>	<b>2 Semester Credit Units</b>
	Introduction, Human Right, Citizen Rights and Obligations, Democracy, National Politics and Strategies, Pancasila, UUD 1945		
53.	KU4026	<b>Penulisan Karya Ilmiah Teknik</b> <i>Technical Writing</i>	<b>2 Semester Credit Units</b>
	Principles and procedure of technical writing; attention to analyzing audience and purpose, organizing information, designing graphic aids, and writing such specialized forms as abstracts, instructions, and proposals.		
54.	KU4183	<b>Sosiologi Industri</b> <i>Industrial Sociology</i>	<b>2 Semester Credit Units</b>
	Labor/management relations in industrial societies; impact of technological change on work organizations and labor markets; implications for understanding various topics including social mobility, labor market segmentation, job satisfaction, work/family relations, immigration and race, power in organizations, union and industrial conflict, organizational culture, and the social control of industry.		
55.	MA1122	<b>Kalkulus I</b> <i>Calculus I</i>	<b>4 Semester Credit Units</b>
	Preliminaries, Functions and Limits, The Derivative, Applications of The Derivative, The Integral, Applications of The Integral, Numerical Methods and Approximations, Transcendental Functions.		
56.	MA1222	<b>Kalkulus II</b> <i>Calculus II</i>	<b>4 Semester Credit Units</b>
	Technique of Integration, Indeterminate Forms and Improper Integral, Infinite Series, Conics and Polar Coordinates, The Derivative in n-Space, The Integral in n-Space, Differential Equations.		
57.	MA2121	<b>Matematika Teknik I</b> <i>Engineering Mathematics I</i>	<b>3 Semester Credit Units</b>
	Algebra (vectors, complex numbers, matrices); Calculus (differentiation and		

	integration of functions of one or more variables); Differential Equations and Probability (basic concepts, events, random variables, empirical discrete and continuous distributions).				
58.	MA2221	<table border="1"> <tr> <td><b>Matematika Teknik II</b></td> <td rowspan="2"><b>3 Semester Credit Units</b></td> </tr> <tr> <td><i>Engineering Mathematics II</i></td> </tr> </table>	<b>Matematika Teknik II</b>	<b>3 Semester Credit Units</b>	<i>Engineering Mathematics II</i>
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<i>Engineering Mathematics II</i>					
	Vector Calculus, Applied Statistics, Partial Differential Equations and Numerical Analysis.				
59.	TI3051	<table border="1"> <tr> <td><b>Ekonomi Teknik</b></td> <td rowspan="2"><b>2 Semester Credit Units</b></td> </tr> <tr> <td><i>Engineering Economics</i></td> </tr> </table>	<b>Ekonomi Teknik</b>	<b>2 Semester Credit Units</b>	<i>Engineering Economics</i>
<b>Ekonomi Teknik</b>	<b>2 Semester Credit Units</b>				
<i>Engineering Economics</i>					
	This course studies the basic concept of time value of money and methods for alternative and investment evaluation. The study covers definition and scope of engineering economics, cash flow, concept of time value of money, present equivalent value, annual value, internal rate of return, payback method, profitability index method, sensitivity analysis, depreciation, inflation and deflation, replacement analysis, tax analysis, public investment cost-benefit analysis. The course provides ability in conducting analysis and decision making for alternative selection or investment evaluation using economic criteria.				
60.	TI4051	<table border="1"> <tr> <td><b>Manajemen Industri</b></td> <td rowspan="2"><b>2 Semester Credit Units</b></td> </tr> <tr> <td><i>Industrial Management</i></td> </tr> </table>	<b>Manajemen Industri</b>	<b>2 Semester Credit Units</b>	<i>Industrial Management</i>
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<i>Industrial Management</i>					
	This course studies the basic concept management and the management cycle in an organization. The study covers definition of management, basic cycle of management, planning, organizing, controlling, business organization, engineering economic concept and investment, product development and innovation, business investment. The course provides basic knowledge of management and its role in improving organization performance.				